

But all the world over the old dies hard, and the new has to struggle into birth so slowly that it is adult by the time it comes out, and the pioneers have to rough it. Logic will be the last science to submit to the sway of Darwinism, but there is no doubt that in the end it, too, will yield to the pragmatist followers of William James.

In addition to writing a large number of articles and reviews which have never been republished, James was the author of the following substantive works:—"The Principles of Psychology" (1890), the "Text-book of Psychology" (1892), "The Will to Believe" (1896), the Ingersoll lecture on "Human Immortality" (1898), "Talks to Teachers" (1899), probably the easiest and most delightful introduction to psychology extant, the "Varieties of Religious Experience" (1902), "Pragmatism" (1907), "A Pluralistic Universe" (1909), and "The Meaning of Truth" (1909).

DR. LOUIS OLIVIER.

DR. LOUIS OLIVIER, whose death we announced last week, was one of the best-known men of science in France, and had many friends also in Great Britain. He was only fifty-six years of age, and that the scientific world should have been deprived of his influence and activities when years of further work were anticipated has caused widespread regret.

For most of the following particulars of his career we are indebted to M. Louis Brunet. Louis Olivier was born at Elbeuf on June 29, 1854. He studied at the Museum of the Sorbonne, and obtained the degree of doctor of science in 1881, with a thesis entitled "L'appareil tegumentaire des racines," which was awarded the Bordin prize of the Paris Academy of Sciences. Entering Pasteur's laboratory, he carried on bacteriological work, which led to some valuable results, such as the reduction of sulphates by micro-organisms, and, in collaboration with M. Ch. Richet, the existence of various bacteria in the lymph and blood of healthy fishes. In 1888 he went to Havre as director of the municipal laboratory there, and to form a course in bacteriology for medical men.

But the work for which Dr. Olivier deserves the lasting gratitude of the scientific world was the foundation of the *Revue générale des Sciences pures et appliquées* in 1890. When making arrangements for the establishment of that journal, Dr. Olivier was kind enough to state that he desired it to have much the same scope and character as NATURE. Possessed of vast knowledge of men and matters in all departments of science, he was able to exercise sound judgment upon the numerous contributions submitted to him, and was successful in securing authoritative collaborators, not only in France, but also in other countries, to deal with subjects of wide interest and prime importance. During numerous visits to England, he obtained the active support of many men of science here, and they mourn his loss as that of a friend as well as of an editor.

At the outset, the *Revue générale des Sciences* was recognised as a substantial addition to the periodical literature of science. The outlook was wide, the contributors men of distinguished eminence and sound knowledge, and the subjects important; and the journal has maintained this character throughout its existence. As an example of the breadth of view, we may mention that arrangements were made by Dr. Olivier for special reports to be supplied to his journal of the meetings of the Royal Society of London and of other leading scientific societies in Europe. So far as we are aware, no other journal abroad gives such attention to the progress of science in Great Britain

as is still devoted to it by the *Revue générale des Sciences*.

In 1897 Dr. Olivier established a series of cruises which have enabled many of his countrymen to visit various places, with guides well acquainted with the aspects of scientific interest presented by them. Among the countries to which he thus introduced many travellers are Spitsbergen, the Canary Islands, Scotland, Egypt, and the Caucasus.

Though Dr. Olivier was not a member of the Paris Academy of Sciences, Prof. Bouchard, who presided at the meeting of the academy on August 16, expressed sorrow at his death, and this testimony to the esteem in which he was held was put on record in the *Comptes rendus*. This exceptional mark of honour shows the high regard in which Dr. Olivier was held in France, and we are sure that in our own country there is real regret that one whose life has been of such great service should have passed into silence while actively engaged in his work for the extension of scientific knowledge.

NOTES.

IN accordance with previous announcements, arrangements have been made to hold the autumn meeting of the Iron and Steel Institute at Buxton, on Monday to Friday, September 26-30. The following are among the subjects of papers to be brought before the meeting:—Electric steel refining, D. F. Campbell; manganese in cast iron and the volume changes during cooling, H. I. Coe; sulphurous acid as a metallographic etching medium, E. Colver-Glauert and S. Hilpert; the theory of hardening carbon steels, C. A. Edwards; the influence of silicon on pure cast iron, A. Hague and T. Turner; the preparation of magnetic oxides of iron from aqueous solutions, S. Hilpert; the utilisation of electric power in the iron and steel industry, J. Elink Schuurman; some experiments on fatigue of metals, J. H. Smith.

At the autumn meeting of the Institute of Metals, which is to take place in Glasgow on September 21-23, the following papers will probably be read:—The heat treatment of brass: experiments on 70:30 alloy, Messrs. G. D. Bengough and O. F. Hudson; some common defects occurring in alloys, Dr. C. H. Desch; shrinkage of the antimony-lead alloys, and of the aluminium-zinc alloys, during and after solidification, Mr. D. Ewen; the effect of silver, bismuth, and aluminium upon the mechanical properties of "tough-pitch" copper containing arsenic, Mr. F. Johnson; metallography as an aid to the brass founder, Mr. H. S. Primrose; magnetic alloys formed from non-magnetic materials, Mr. A. D. Ross.

A HITHERTO unknown region in New Guinea, near the central mountain range in Netherlands territory and west of the Fly River, has been visited by a Dutch explorer, Dr. H. A. Lorentz, who has published an account of the inhabitants. These, unlike the people found further west by the English expedition under Captain Rawling, are not pigmies, and most of Dr. Lorentz's description shows that they are not very far removed from the typical dwellers in the Fly River region. They wore no clothes, and lived in small huts about ten feet from the ground, as do some of the people of the Fly delta. As usual among the western Papuans, they used the bow and arrow, and had stone axes, the common weapon of all Papuans, until the advent of the white man. Mutilation was practised. The women cut off the middle finger of the left hand, the men removed the upper portion of one ear. This tribe was found to smoke and grow tobacco, which is not used on the coast of

Netherlands New Guinea, though used in the valley of the Fly River, and in the central district of British New Guinea, whence it has spread along the coast. The discovery of its use and culture among these mountaineers suggests that the custom was introduced into New Guinea from the north. Dr. Lorentz suggests intercourse with the northern coast, as the mountaineers wore large sea-shells as breast ornaments. No accurate information was obtainable, as intercourse was carried on only by signs.

MR. J. HEWITT, assistant for lower vertebrates in the Transvaal Museum, and formerly curator of the Sarawak Museum, has been appointed director of the Albany Museum, Grahamstown, South Africa, in succession to Dr. S. Schonland, who has resigned owing to pressure of other work. The herbarium is still under the care of Dr. Schonland.

A REUTER telegram from Spezia announces the death, on August 28, of Prof. Paolo Mantegazza. From a short notice in the *Times*, we learn that Prof. Mantegazza was born at Monza on October 31, 1831. After having studied at Milan and at Pisa he devoted himself to the study of medicine, and took his degree as doctor of medicine at Pavia. He early acquired a reputation, which increased steadily until he came to be regarded as one of the most learned physicians and the first hygienist of Italy. His method of exposition was easy, brilliant, and attractive, and did much to popularise the teaching of medical science. His devotion to his profession, however, did not prevent him from taking an active part in public affairs. A member of the Consiglio Superiore di Sanità, Mantegazza was also professor of general and experimental pathology in the University of Pavia, whence he proceeded to teach anthropology in the Istituto di Studi Superiori in Florence, in which city he founded the first anthropological and ethnographical museum ever established in Italy. In November, 1876, he was included by Royal decree amongst the Senators of the Kingdom.

DURING the past month sixteen advanced students and researchers have been at work at the Port Erin Biological Station. The Oceanography course conducted by Prof. Herdman, with Dr. Dakin and Dr. Roaf, during the first half of August was attended by eight, and consisted partly of lectures and laboratory work in the Biological Station and partly of work at sea. One day was spent in fish-trawling on board the Lancashire Sea-fisheries steamer, and other occasions in plankton work and dredging from the s.y. *Ladybird*. The contemplated addition of a new research wing at the back of the present building has now been decided on, and the work will be commenced in a few days. This new building will provide an addition to the library and a large experimental-tank room and two smaller research rooms with large tanks for physiological and other experimental work on the ground floor, and a series of eight separate research rooms, each with two windows, on the upper floor. The whole will be completed in time for use during next Easter vacation. The addition is made necessary by the increase in the number of students and research workers at the Port Erin Biological Station. A circular letter stating that 350*l.* would be required to build the new wing was issued by Prof. Herdman in May last, and since then the sum of about 250*l.* has been raised. It is hoped that the balance will soon be found; and in the faith that the work of the laboratory justifies the extension, the building is to be commenced.

THE eleventh annual meeting of the Astronomical and Astrophysical Society was held at the Harvard College

Observatory, August 17-19. The programme included about fifty papers, and the meeting was well attended, among those present being many astronomers and physicists, who have gone to the United States in order to attend this meeting and that of the International Solar Union at Pasadena.

THE subject of the celebrated skull discovered at Galley Hill, Kent, in 1888, and now in the possession of Dr. F. Corner, formed the subject of a full-dress debate before the Anthropological Society of Paris, of which a report is included in the last issue of its *Bulletins et Mémoires*. The character of this skull has been discussed by many British anthropologists. Mr. E. T. Newton attributed it to the race known as that of Néanderthal; and this view was more or less accepted by M. Paul Raymond, while it was questioned by authorities such as MM. Fraipont, Hervé, and A. de Mortillet. The result of the debate was thus inconclusive. But, on the whole, the doubts of Prof. Boyd Dawkins and the late Sir John Evans, the latter expressing surprise at the discovery of an entire cranium in the diluvium, will suggest an attitude of caution in arriving at any definite conclusion on the age and racial affinities of this remarkable specimen.

THE forty-fourth volume (Series 3, vol. v.) of the *Journal of Anatomy and Physiology* is completed by the number published in July last. The papers which it contains nearly all refer to the human subject, and are therefore of interest more particularly to medical men. We may direct special attention to an elaborate account of the development of the larynx by Mr. J. E. Frazer, which illustrates very well the important part now played by wax model reconstruction in the study of human embryology.

IN the August number of the *Zoologist* Colonel C. E. Shepherd gives the results of investigations in regard to the relative sizes of the otoliths in various species and groups of bony fishes. Among the catfishes, it is noteworthy that while in the fresh-water *Synodontis schal* all these bones are very small, in the marine *Ælurichthys gronovii* one of them is very large. This suggests a difference between deep- and shallow-water fishes in this respect, but the idea is negated by the fact that deep- and shallow-water members of the Berychidæ have otoliths of nearly similar relative size. All flat fishes likewise agree in the large size of these bones, so that in both instances adherence to a constant family type overrides adaptation in this matter. More promise seems to be afforded by the idea that the size of the otoliths may vary in proportion to the degree of development of visual power, long rectal ocular muscles, which indicate a quickly mobile eye, being correlated in the Scœmbridæ in most cases with small otoliths. In the Gadidæ, on the other hand, the eye-muscles are short, indicating an eye with little mobile power, while the otoliths are large. Although his investigations show that such a correlation holds good in the case of a large number of the species examined, Colonel Shepherd remarks that it cannot yet be regarded as proved that quickness of sight among fishes is compensated for by dullness of hearing, or that acute hearing accompanies an increase in the size of the otoliths. It is added that in sharks and rays the otoliths are represented by "ear-dust," although why this should be so is at present a mystery.

CONSIDERABLE interest attaches to a paper by Dr. Einar Lönnberg published in vol. vii., No. 2, of *Arkiv för Zoologi*, in which it is shown that the hinder teeth of very young white whales (*Delphinapterus leucas*) constantly

display a more or less distinctly tricuspid character, as was suggested by Mr. True would prove to be the case. In certain respects the white whale is known to be a primitive type, and this is now further emphasised by its tooth-structure. The teeth of the species are, however, in some ways distinctly specialised, so that they could not have given rise to those of typical dolphins. Consequently, the author is of opinion that the white whale should be separated from the Delphinidæ as a distinct family (Delphinapteridæ), and also that each of these families should be regarded as divergent branches from a common ancestral type.

We have to acknowledge the receipt of a copy of the report of the Otago University Museum for 1909-10, which is illustrated with a view of the building showing the new wing built for the reception of the library and pictures recently presented by Dr. Hocken.

THE natural features of the Australian Grampians, a mountain range accessible from Stawell, in Victoria, forms the subject of a note by Mr. A. G. Campbell in the *Victorian Naturalist* (vol. xxvii., No. 2). The sandstone hills are the habitat of several rare plants, including the singular little *Candollea sobolifera*; here, too, the native heath, *Epacris impressa*, luxuriates in a magnificent and long-flowering season. The cliff faces are veritable rock-gardens of Epacrids and Grevilleas, while the foot-slopes are favourable to the growth of orchids. *Caleya major* and *C. minor* are two rare orchids found by the author.

THE two "Master's lectures" on the adaptation of the plant to the plant, delivered by Mr. A. D. Hall before the Fellows of the Royal Horticultural Society, are published in the journal of the society (vol. xxxvi., part i.). Perhaps the most instructive lessons are based on the reading of crop-distribution maps, from which the author deduces the primary importance of the mechanical composition of the soil. Following these articles, the journal contains, amongst the contributions, a paper by Mr. C. C. Hurst on the application of Mendel's laws of heredity to horticulture, an account by Miss E. Armitage of cultivation by the peasants in Madeira, and notes on insect pests in the West Indies by Mr. R. Newstead. Mr. Hurst quotes from recent experiments by Cambridge workers in connection with the elucidation of the complicated colours of the snapdragon and variation in sweet peas, and discusses the origin of "albino" orchids, which can be explained upon the assumption of two complementary colour factors.

BULLETIN 419 of the United States Geological Survey contains a collection of analyses of rocks and minerals made in the laboratory of the Survey during the years 1880-1908. It is compiled by Dr. F. W. Clarke, chief chemist, who has also furnished an interesting introduction. This is the third collection issued by the U.S. Geological Survey, and will be of great use to petrologists in general. The analyses are 2420 in number, half of these belonging to igneous and crystalline rocks, and in all the later ones a large number of constituents are separately estimated. The analyses not included in the last edition (Bulletin 228) are mostly those of igneous rocks from the western States, and there are also numerous analyses of minerals isolated from crystalline rocks. An innovation which we regret is the use of a smaller type, presumably with the object of saving space.

THE summary of the weather issued by the Meteorological Office for the week ending August 27 shows that the rainfall for the period was exceptionally heavy in nearly

all parts of the country. Falls of an inch or more within twenty-four hours are noted as having occurred over a wide area: on August 23 in various parts of England and Wales, on August 25 in Scotland and at Waterford, and on August 26 at Stonyhurst. The largest measurements were 2'38 inches at Crieff on August 24 and 1'69 inches on August 25, 2'2 inches at Stornoway and 1'60 inches at Stonyhurst on August 26. At Crieff the total for the week was 5'89 inches, the three days, Tuesday to Thursday, giving 5'19 inches, of which 3'50 inches fell in twenty-three hours. The succeeding days were also very wet in many parts of the country, and at Bath the aggregate for the two days, August 28 and 29, amounted to 2'57 inches, which is nearly equal to the average aggregate fall for August.

THE report of the Meteorological Committee for the year ended March 31 shows that the business of the year was exceptionally important. Arrangements for new premises at South Kensington claimed much attention; these will include space for a museum and better accommodation for the library, which now contains some 21,500 books and pamphlets, and is rapidly increasing, in addition to which space is required for a very large number of valuable documents from ships and land stations. The negotiations relating to the control of the observatories at Kew and Eskdalemuir resulted in making the committee responsible for the whole of the work, except the verification of instruments, aided by the scientific advice of a committee appointed by the Royal Society (see NATURE, June 23). Important changes have been made in some of the periodical publications of the office, e.g. the daily weather report includes important telegrams from Funchal, Madeira, and for the new year the ordinary forecasts for twenty-four hours have been extended when conditions are regarded as favourable. Weekly editions of the monthly North Atlantic charts are now issued showing the weather conditions over that ocean up to the day prior to that of publication. The director points out that these promise to be of considerable use to the forecast branch of the office. Wireless reports from the Royal Navy are found to be of much value, and those from the Atlantic liners have improved; in the course of the year, 4388 reports were received from the latter, and 42 per cent. arrived within twenty-four hours of the time of observation. The percentage of success (complete and partial) of the forecasts issued at 8h. 30m. p.m. for the whole of the British Islands in 1909 was 93, the highest on record, but the percentage of complete success, although higher than the mean for the last ten years, was lower than in 1906; the success or otherwise depends to some extent on the character of the weather, as shown more particularly by the harvest forecasts. Investigation of the upper air was actively continued, and the results were published, as before, in the Weekly Weather Report.

AN editorial note in the August number of the *Illuminating Engineer* of New York directs attention to the movement now on foot to educate the employees of American lighting companies through the medium of the American Gas Institute and the National Commercial Gas Association, in much the same way as some of the larger electrical firms have afforded facilities to their employees. According to the editor, it is felt that the time to sneer at "book larnin'" is now past, and the "self-made" practical man, while continuing "to worship his maker," must do it "secretly in his closet." On the other hand, when the college-trained man thinks he "knows it all," he "has no further mission in this world,

and should be translated to some other sphere." To the man who is interested in every detail, whether scientific or commercial, of the business, each item of knowledge is of positive value, and the more he has the better it is for himself and his employer.

ALTHOUGH the use of "invar" wire with a very small coefficient of expansion in the measurements of the base lines of geodetic surveys has rendered an accurate knowledge of the temperature of the wire of less importance than it formerly was, it is still necessary if an accuracy of one part in a million is desired to know that temperature to within 1° C. In general, the temperature of the air, determined by means of a swinging thermometer, has been taken as identical with that of the wire; but Mr. B. F. E. Keeling, in a communication to the July number of the *Cairo Scientific Journal*, shows that, under field conditions, the wire temperature is about 2° C. higher than the air temperature owing to the absorption of sunlight at the surface of the wire. His method consists in substituting for the invar wire two wires of copper and constantan of the same diameter as the invar wire soldered together, so as to constitute a thermocouple, and connected to a galvanometer. The temperature of the junction exposed under field conditions is then determined from the galvanometer deflections.

THE *Builder* for August 27 comments on the facilities provided at the Brussels Exhibition for the beginning and rapid spread of fire. The liberal employment of canvas and other textile fabrics as structural and decorative materials doubtless served to render the sections affected by the disastrous fire even more than usually vulnerable. Apart from this characteristic, there is no reason for believing the average exhibition to be much safer from fire than that which has paid so heavy a price for attempted economy. No exhibition within recent times has been better conceived from the structural point of view than the Paris Exposition of 1900, where numerous important buildings were constructed entirely in reinforced concrete so as to afford safe accommodation for artistic, historical, and other treasures beyond all price. The example thus set is one that should always be followed, regardless of cost. We must break finally with the traditional flimsy structure of wood, canvas, and plaster. Steel is quite permissible if inexpensively sheathed in fire-protective casing, and is essential in roof construction. But timber wall panels, interior partitions, floors, roof framing, and roof covering must be given up. Expanded metal, wire netting, and steel lathing can easily be stretched between the main stanchions as the basis for incombustible walls and partitions formed of cement, mortar, or fire-resisting plaster.

FOR nearly four years past, the firm of Westinghouse, Church, Kerr and Co. has had in hand an investigation of the rust-preventing properties of protective coatings for structural steel. The *Engineering Magazine* for August contains a brief account of the results in the form of a paper read by Mr. C. M. Chapman before the American Society for Testing Materials. More than 500 coatings were tested, each paint being applied to two mild steel plates of about No. 16 gauge, 2 inches wide and 6 inches long. One plate was given one coat and the other two coats. After drying, the plates were fastened to boards with galvanised iron tacks, and exposed on the roof at an angle of 45 degrees, facing south. On the day the plates were exposed, scratch marks were made with a sharp instrument across two opposite corners of each plate,

leaving bright metal exposed, so that rusting started immediately along these lines. At regular intervals each plate was examined, and a record made of its condition. The one quality which was being sought was protection against rust. The tabulated results show that with one coating the red leads take first place, both for one year's and two years' exposure. With two coatings and one year's exposure the white leads take best place; with two years' exposure the red leads are best. Red-lead primers, zinc oxides, iron oxides, carbons, and graphites also come out very good in these tests.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN SEPTEMBER:—

- Sept. 1. 8h. 3m. Venus in conjunction with Moon. (Venus $4^{\circ} 26' S.$)
14. 6h. 5m. to 7h. 23m. Moon occults ω Sagittarii. (Mag. 4.8.)
- „ 7h. 56m. to 9h. 15m. Moon occults A Sagittarii. (Mag. 4.9.)
15. Saturn. Major axis of outer ring = $45.36''$, minor axis = $13.94''$.
17. 12h. 36m. Minimum of Algol (β Persei).
20. 9h. 25m. Minimum of Algol (β Persei).
21. 11h. 30m. Saturn in conjunction with Moon (Saturn $1^{\circ} 31' S.$)
23. 10h. 31m. Sun enters Libra. Autumn commences.
23. 13h. 43m. to 14h. 5m. Moon occults κ' Tauri. (Mag. 4.1.)
23. 14h. 13m. to 14h. 59m. Moon occults ν' Tauri. (Mag. 4.2.)

THE PARIS OBSERVATORY.—M. Baillaud's report of the Paris Observatory, for 1909, opens with a fitting tribute to the memory of MM. Fraissinet and Paul Gautier, and then proceeds to give an account of each department of the work and its labours during the year. Among other things, he mentions that the "cercle méridien du Jardin" has been completely overhauled and made perfect, while the programme has been greatly modified; the instrument is now being employed to observe fundamental stars, and will eventually undertake observations for the large catalogue proposed at the last meeting of the Paris Conference.

When not in use for spectroscopic work, the large *coudé* equatorial was employed by MM. Puiseux and Le Morvan for photographing the moon and planets; 218 images of Jupiter were secured between February and May, and later in the year more than 1200 images of Mars were secured.

A reproduction of the spectrum of Arcturus, original size, shows how effective are the new arrangements for employing the large *coudé* for stellar spectroscopy; the definition is magnificent, and the length of the spectrum between $\lambda 4100$ and $\lambda 4800$ is 15.4 cm.

The small equatorial *coudé* was employed by Dr. Nordmann in his photometric determination of stellar temperatures, and, with M. Salet, he has undertaken the observation of 300 stars of various spectral types.

OBSERVATIONS OF COMET 1910a.—In No. 4433 of the *Astronomische Nachrichten* Dr. Karl Böhlin publishes an excellent photograph and two drawings of the great comet, 1910a, as observed at Stockholm on January 28. The photograph shows the main tail 18° long, cleft at its extremity. The two drawings show enlarged views in the neighbourhood of the head, and in the second the head appears to stand out from the general plane in the form of a half moon.

THE SUN'S VELOCITY THROUGH SPACE.—In No. 1, vol. xxxii., of the *Astrophysical Journal* Profs. Frost and Kapteyn discuss the value of the sun's velocity through space as derived from the radial velocity of Orion stars. The reasons for employing this class of stars are fully discussed, and the stars considered were taken from within a moderate distance of the apex, or the antapex; for the former, the position $\alpha = 269.7^{\circ}$, $\delta = +30.8^{\circ}$ (1875.0), was taken, and the fact is elucidated that the Orion stars are, as a rule, at a great distance from the sun. This fact may